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THE ALLOCATION OF FINANCIAL RESOURCES IN HIGHER EDUCATION.

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THE EFFICIENT USE OF THE UNIVERSITY'S LIMITED FINANCIAL RESOURCES INVOLVES ADMINISTRATIVE DECISIONS THAT SPREAD ACROSS THE SPECTRUM OF CHOICE. THE PURPOSE OF THIS PAPER IS TO IDENTIFY BASIC CONCEPTS INVOLVING THE ALLOCATION OF FINANCIAL RESOURCES. THE BUDGET IS EMPHASIZED AS A TOOL WITH WHICH THE DECISIONMAKER CAN FOCUS AND SHARPEN HIS GRASP OF THE ALTERNATIVES. THE BUDGET IS DEFINED, ITS PURPOSES DELINEATED, AND THE BUDGET PROCESS ITSELF IS PRESENTED IN THREE STEPS--PREPARATION, ADOPTION, AND EXECUTION AND CONTROL. PROGRAM BUDGETING, A MORE RECENT BUDGETING TECHNIQUE, IS PRESENTED TO INDICATE THE SYSTEMATIC APPROACH, FURTHER IDENTIFYING THE SPECTRUM OF CHOICE. FINALLY, A BRIEF DISCUSSION IS INCLUDED CONCERNING THE SYSTEM SIMULATION MODEL APPROACH FOR USING THE COMPUTER TO IMPROVE THE ALLOCATION OF RESOURCES OF INSTITUTIONS OF HIGHER EDUCATION. THIS PAPER WAS PREPARED FOR EDUCATION 925.35, AUTUMN QUARTER, 1967, AT THE OHIO STATE UNIVERSITY, COLUMBUS. (HW)

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THE ALLOCATION OF FINANCIAL RESOURCES IN HIGHER EDUCATION

by

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Education 925.35

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THE ALLOCATION OF FINANCIAL RESOURCES IN HIGHER EDUCATION

Introduction

> It is the essence of decision making, therefore, to choose among alternative ends and to ration scarce means to their accomplishments.....The budget process is the activity through which this work is done. The budget is the instrument through which the process is made operational. (Anshen, 1965)

The efficient use of the university's limited financial resources involves administrative decisions that spread across the spectrum of choice. The university must function as both a buyer and a seller of services. With limited access to resources, the university cannot purchase or provide for an infinite variety and level of services: Administrators must, therefore, decide how best to use their limited resources.

The basis for making decisions may include any number of criteria. In some cases this year's allocation may be exactly the same as some previous year or may be increased or decreased for some obscure or obvious political reason. In other cases the donor of funds may have constrained the application of resources. However, under a system aimed at the "best" or "preferred" or the "most rational" use of resources, allocations should be able to withstand the rigor of analytical studies which ask <u>why</u> a university has so mixed and so distributed its limited resources. (Williams 1966)

The purpose of this paper is to identify basic concepts involving the allocation of financial resources. The importance of the budget will be

emphasized not as a substitute for judgment, but as a tool with which the decision-maker can focus and sharpen his grasp of the alternatives. Program budgeting, a more recent budgeting technique, will be presented to indicate the systematic approach to further identify the spectrum of choice. Finally, a brief discussion will be included in this paper concerning the system simulation model approach for using the computer to improve the information with which to allocate the resources of institutions of higher education.

Definition of Budget

A budget is undeniably a primary instrument of fiscal control, but it is more than that. Williams (1966) suggests "a budget should also lay bare the efficiency (or lack thereof) with which a university is combining its available resources to achieve results that promote the goals and objectives of that university." The budget should exhibit the flow of funds between income and expenditures, and should reflect the extent to which the present programs contribute to the long-range objectives. Corbally (1962) says "a budget is an expenditure plan developed for a given unit of time - usually one year," and then more specifically that a school budget is "an expression in dollars of an educational plan and and program." Bartizal (1942, cited by Roe, 1961) emphasized the forecast and efficiency aspects: "A budget is a forecast in detail of the results of an officially recognized program of operation based on the highest reasonable expectation

of operating efficiency." Roe (1961) says a budget is "the translation of educational needs into a financial plan which is interpreted to the public in such a way that when formally adopted it expresses the kind of educational program the community is willing to support, financially and morally, for a one-year period." Russell (1954) emphasizes the three distinct aspects of the budget. In the first place, the budget must be a plan, carefully thought out in advance; the parts adequately related to each other; and subject to modification to care for unforeseen conditions. In the second place, the budget must cover both income and expenditure and relate them effectively. In the third place, the budget must refer to a specific period of time, with fixed opening and closing dates.

Purposes of the Budget

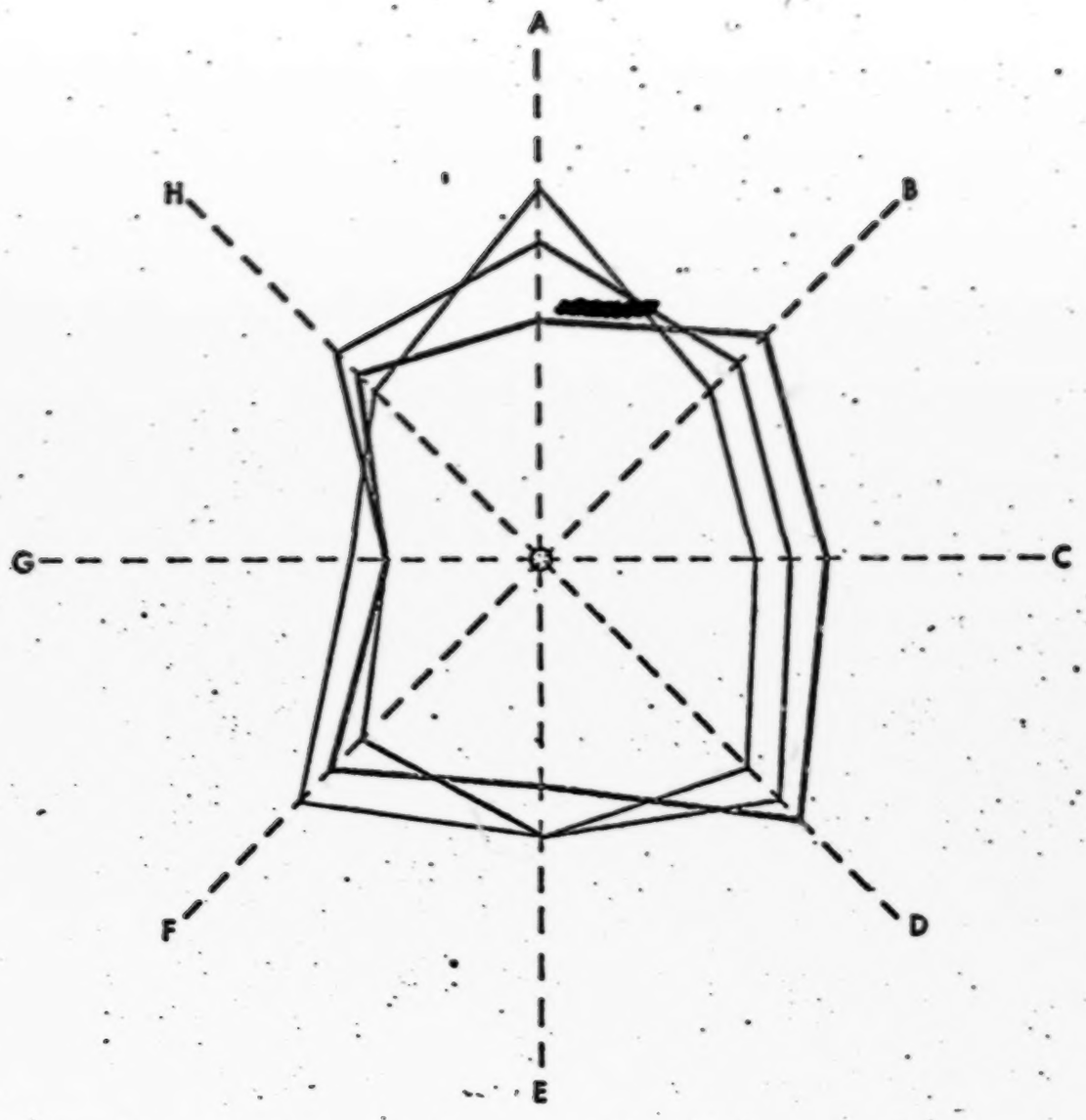
The general purpose of the budget as conceived by Russell (1954) "is to provide an instrument for the administrative control of an institution." This is a rather restricted view of budgeting. Roe (1961) expands this concept by saying "a budget should be basically an instrument of planning and only incidentally one of control." The breaking down of the elements of a total plan into their departmental or sectional components allows costs to be more easily estimated. These elements must then be reassembled into a whole so that comparison may be made with total revenues. Budgeting, then, according to Roe (1961), "forces the administrator and his staff to plan together on what needs to be done, how it will be done, and by whom."

Corbally (1962) goes a step further to say "budget development should begin with a consideration of the purposes of the enterprise expressed as much as possible in terms of measurable outcomes." Thus, if the educational purposes of the institution have concrete meaning, or at least form some guidelines for the educational program, then it is possible to evaluate the degree to which the budget is reflecting the educational purposes. The purpose of the budget, then, is to express in dollars the educational plan as it reflects the educational purposes desired by and accepted by the institution.

The Theory of Constrained Choice

The chief administrator of an educational institution, in attempting to find the programs reflecting the purposes and objectives of that institution, is confronted with the situation in which there are more and more competing demands for resources than there are resources available. A logical approach to the efficient allocation of resources would involve some variant of a theory of constrained choice. Allocation of budget monies under conditions of constrained choice may be defined (Williams 1966) as "the administrative process of choosing bounds and routes for channeling limited resources into alternative areas of utilization, which choices are then reflected in the operating budget for the year."

Figure 1. shows a simple graphic presentation by Williams (1966) of the process by which the resources of a university would be distributed



□ = □ = □ = Total available resources

A
| = Funding of major program areas
O

Iterations in the Program Budgeting Process

Figure 1

under conditions of constrained choice. Each radial line represents a different program area of the university, and the length of the line within the closed figures represents the level of funding allocated for each program. The area enclosed by the figures remains constant through each of the three steps shown here, indicating the fixed quantity of the resources available to the university. An increase in the funding of one program area decreases the funds available for other program areas. Similarly, decreasing program funds in one case permits higher funds for the others. This conceptual framework is oversimplified, but it does promote thinking in terms of alternatives, increments, and comparative payoffs. It focuses attention on those basic decisions forced upon those who are required to make an efficient use of limited resources. It is a way of thinking about decisions so that preferred alternatives are readily identified.

The Budget Process

The development of an educational budget may be divided into a number of clearly defined steps. Russell (1954) lists three: 1) preparation, which involves the making of the financial plan, 2) adoption, an act by the controlling agency, and 3) execution and control, covering the management of the budget during the fiscal year to which it relates.

The budget process according to Roe (1961) "is a cyclic, never-ending function consisting of seven basic steps: planning, coordinating, interpreting, presenting, approving, administering, and appraising." The

activities are continuous and may take place at any time of the year, but there are certain times when one or another activity may be intensified.

In most institutions it is customary to divide budgeting activity into two major parts. The assembling of expenditure programs for the administrative offices, plant operations, maintenance, and the auxiliary service enterprises is the responsibility of the business manager. To assemble the expenditure programs for the educational units of the institution is the responsibility of the academic dean, provost, or comparable official.

The business manager also calculates the expected revenues including student fees, endowment income, gifts and appropriations. At this point, as Millett (1952) suggests, "follows a more or less protracted series of negotiations." The two major parts of the budget, the educational part and the business part, must be brought together. Since ordinarily both requests will exceed expected income, the administrators must decide whether to try to increase income or decrease the total expenditures.

When the budget is finally adopted, the business manager must faithfully implement the program. Usually the budget appropriation can be modified only by the board of trustees or by the president within the realm of discretion delegated him by the board.

A more comprehensive listing of the activities associated with the budgetary process as prepared by Corbally (1962) is presented here with slight modification:

1. The development of an educational plan which is based upon the

purposes of the institution.

2. The collection and appraisal of data which indicate the present state of the educational program and which reveal the future needs.
3. The preparation of an expenditure plan which will permit continuation and improvement of the present plan, as well as the addition of necessary program elements, and the elimination of unnecessary program elements as required to meet the educational plan.
4. The preparation of a revenue plan which will provide the funds necessary to meet the expenditure plan.
5. The consolidation of the expenditure and revenue plans into a formal budget document.
6. The presentation of the formal budget document for consideration, revision, and final adoption.

One final step not included in the above but presented separately by Corbally (1962) is the administering of the budget:

> "the encumbrance of funds authorized by the budget through contracts and purchase orders; the receipt of goods or services as specified by the encumbrance instruments; the authorization of payment for goods or services through vouchers, and the actual payment of funds for goods or services as authorized by vouchers."

To complete the budgetary procedure would include accounting, auditing, reporting, revising, and the final closing out of the budget at the

end of the fiscal period.

Problems of Educational Budgeting

In a commercial organization there may exist a rather direct relationship between income and the expenditure of funds. In educational accounting and budgeting systems the link between receipts and expenses are more difficult to relate. As Williams (1966) says, "a commercial firm can get objective measurements of its profits, number of products produced (or value added), and its costs as they relate to these products and thereby decide to expand, remain in a steady state, or shut down this line of production." Measuring and evaluating the outputs of an educational institution are much more difficult.

Income received by the university comes from many sources and the donor frequently restricts the use of these funds. At the same time, the basis for spending these funds may be separately established. This weak link between income and expenditure makes financial analysis complicated, if not impossible. Most university officials, says Williams (1966), "are overwhelmingly concerned with complex and detailed accounting procedures for both sides of the income-expenditure flow." He is not suggesting that all universities are inefficient, but that they may seek efficiency only on two separate occasions "in generating income and in spending it - without ever considering the two together and without determining whether or not a preferred combination of resources has been used."

The commercial enterprise receives a signal from the market through a comparison between its income and expense. The educational institutions, Willaims (1966) points out, "must substitute analytical studies of its activities, their duration, and level for the forces of the market place. This is to say that a college or university must analyze and review the effectiveness with which it is pursuing its over-all purposes and objectives."

Rourke and Brooks (1966) say the quantification and the objective analysis in education is difficult and is subject only to the grossest kinds of measurement. The hours spent in the classroom by students or professors measures very little about academic performances, yet student credit-hours and full-time-equivalent work loads have been widely employed as an indirect measure of otherwise immeasurable activities.

The longstanding traditions in academic life also restrict the application of rigorous budgetary procedures. Customarily, each academic area is given at least as much as it received in the previous year. This is the base, or starting point, and only rarely can the merits of this base be successfully questioned. The tenure system also causes problems since tenured professors cannot ordinarily be dislodged from their positions. Also, the idea of equity in resource allocation restricts rationalized budgeting. All academic areas want their share of the financial resources, so authorizing additional funds in one area will create demands for equal funds from other areas. Any proposal threatening the base or violating the concept of fair shares is likely to encounter opposition.

The fierce competition for faculty members and students will often drive administrators to over-ride all objective budgetary yardsticks. As Rourke and Brooks (1966) contend, "the academic market place today is simply not hospitable to administrators taking a 'hard line' on budgetary decisions."

Yet despite the restraints imposed on budgeting by problems of measurement and the character of academic life, the techniques of modern budgeting are very much in evidence.

New Directions in Budgeting

The change in budgetary practice in higher education has been a conversion from the old-style object or line-item budgets to a new system of program budgeting. A recent survey by Rourke and Brooks (1966) showed that three-fourths of American state colleges and universities now employ some form of program budgets, while only a fourth still use a strict object budget.

The object budget reveals only the items for which checks are written to pay bills. The principal classifications in a typical object type budget are salaries and wages, materials and supplies, other current expense, maintenance, capital outlay, travel, etc. Such a budget is a useful record of the institution's expenditures but indicates virtually nothing about the way in which money is being spent to achieve the major goals of the institution. The program budget, by contrast, is an effort to arrange the budget according to institutional purposes or programs. The recorder can readily

identify at a glance the principal objectives of the institution and the amount of money assigned to each area.

An excellent example of using a stylish format and modern techniques of reporting and displaying a budget in programmatic terms is shown in Figure 2.

A majority of the institutions in Rourke and Brooks' (1966) survey make use of a format which mixes object and program categories. This mixture usually means that the program categories are the major units of classification within the total budget, while expenditures for each program are broken down according to object categories.

But stylish formats and graphic displays are not enough. Since the budget reflects the overall purposes and objectives of the institution, it is important as Williams (1966) suggests to "explore certain improvements:

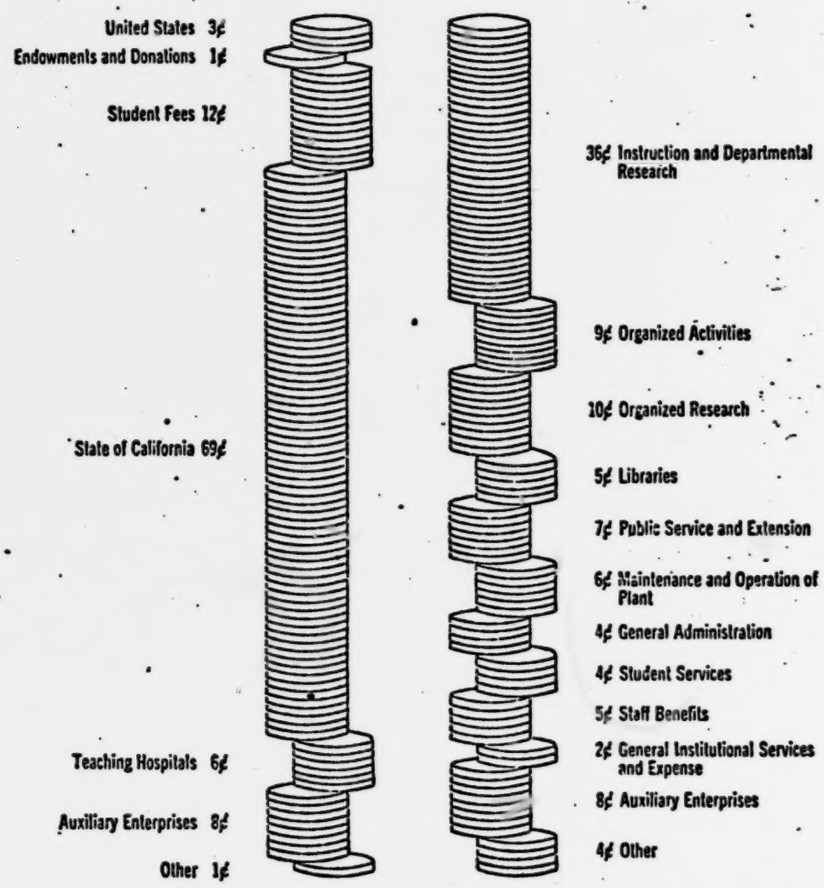
> for example, meaningful budget structures, more concern with effective use of resources, more substantive dialogue concerning the budgetary unit, more analytical justification for requests from budgetary units, and more awareness of the interaction and interdependency among budgetary units."

Program Budgeting

Program budgeting or the Planning-Programming-Budgeting-System as it is called in the Department of Defense was introduced by Secretary Robert S. McNamara for one purpose (Hitch, 1967): "to improve the high-level planning of the department." The use of program budgeting does not

UNIVERSITY OF CALIFORNIA, BUDGET FOR CURRENT OPERATIONS, 1966–1967

THE 1966–67 BUDGET DOLLAR



Note: Budget illustration provided by the courtesy of the University of California's Office of Business and Finance.

Figure 2

imply (Williams 1966) "the destruction of existing accounting, fiscal, and budgetary processes, but rather some measures that will complement those activities with useful concepts involving more planning and analysis, longer time frames, and greater concern for the economic implications of a budget."

The term "program budgeting" means different things to different people. To some it suggests no more than restructuring budget exhibits, accumulating costs in more meaningful categories. To others, a program budget implies a budget that employs a longer time horizon than the commonly found projection limited to one year. To still others, the concept of program budgeting includes the use of cost-utility analysis, a logical and measuring relation of inputs and outputs. Finally, there are those who understand the term to imply all the foregoing plus one significant addition (Novick 1965): "Arrangements for enforcing the allocative decisions through appropriate implementation provisions. Such arrangements might, for example, include institutional reorganization to bring relevant administrative functions under the jurisdiction of the authority making final program decisions."

There are three major phases of program budgeting: planning, programming, and budgeting. Planning is the process whereby the institution establishes its long-range purposes and objectives. Programming is the process of specifying more immediate shorter-range goals for each operating unit, these goals reflecting rather directly the results of planning. Budgeting is simply the formulation of an annual or biennial plan, making

explicit the composition and extent of all the program elements dealt with in the programming phase. The relationships between these three phases and the content and feedback or replanning stage are graphically shown by Williams (1966) in Figure 3.

a. Planning

Allocation of resources by responsible educational administrators to a long term program can be accomplished only after detailed plans have been worked out, plans that take into account all factors likely to be relevant. Tickton (1959) would include in this process not only considerations for the historical data, but more importantly, the assumptions for the future economic situation involving the entire world as well as the specific implications for the institution itself.

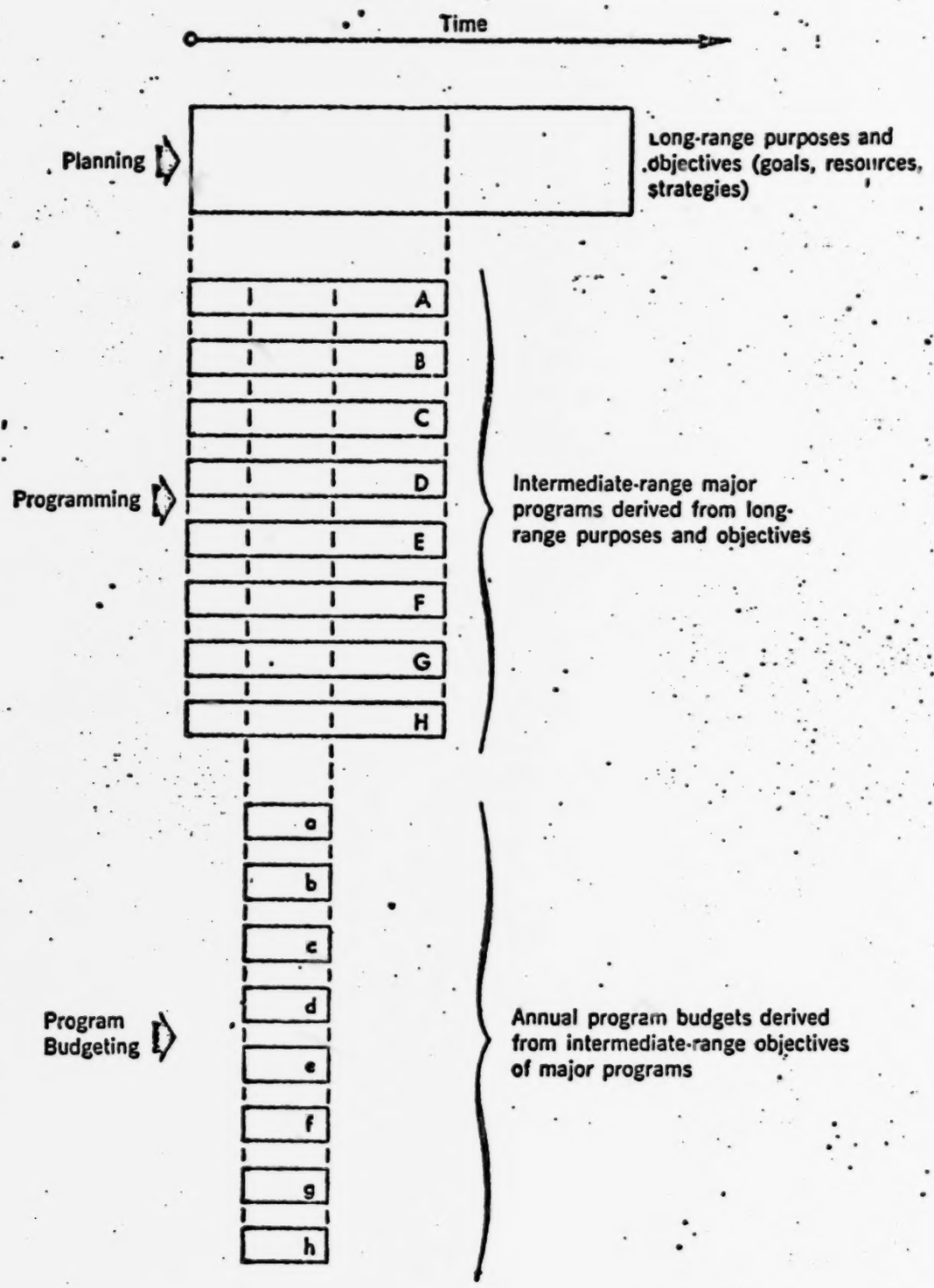
Planning starts with establishing the over-all purposes and objectives and the developing of a long-range plan. This is not to be a plan construed as an abstract conceptualization, but rather as Williams (1966) suggests, as one that every member of the faculty and administration and perhaps even some students develop by asking some basic questions along the following lines:

Why does this institution exist and for what purpose was it established?

Were those purposes meaningful?

To what extent have these purposes been achieved?

Where does the institution currently stand with



The Derivation of Program Budgets

Figure 3

reference to its long-range objectives?

How flexible is this institution to meet uncertain future requirements?

What is my role at present and my role in the future in furthering the long-range plans?

The purposes and objectives must be stated in fairly concrete terms as illustrated by the following hypothetical and incomplete list:

The institution will serve undergraduates, public service requirements, and research in a ratio of effort approximating 5:3:2.

Total enrollment will expand to 5,000 students over the next ten years.

Faculty will be expanded to achieve a 1:15 faculty-student ratio with a teaching-research ratio of 2:1.

The major program emphasis will continue to be in Liberal Arts, with a gradual phase-out of professional schools.

There should be an examination of several alternative positions with a more or less continuous review of the present purpose and objectives, keeping always in mind the possibility of evolving new ones. The participants in the planning process should be concerned with realistic and attainable alternatives that are meaningful and measureable.

b. Programming

In the planning process, long range plans are developed that may not be articulated in great detail. The programming phase is designed to articulate the plans as explicitly as possible.

While long-range plans may extend for ten to thirty years, programming would probably be limited to five, although some aspects might be extended eight or ten years. Since program budgets should promote flexibility rather than rigidity in application, alternative means of using the estimated resources should be assessed to determine value of their contribution. Each department, college, and every other major division of the university should be concerned with these alternatives. This planning and programming process will focus attention on the problem of "trade-offs" (Williams 1966):

> "at all times, and at all levels of decision, having more of one resource means having less of another. The attempt to rationalize all levels of the decision-making process is not an end in itself: it is a means to induce the participants to ask meaningful and rational questions concerning the allocation of resources rather than to present themselves as ad hoc users of resources."

Programming is essentially grouping together people, equipment, and activities in relation to their principal educational tasks to form programs. Programs are combinations of activities that produce distinctive outputs. Programs and their related costs must be projected into the future, because it is necessary to know the future cost implications of decisions just as it is important to know the present cost implications.

Costs identified with specific programs are also identified with resource

categories. Resource categories may follow any useful resource classification scheme. Using the conventional budget lines for resource categories is one such possibility. In this way, a definite relationship to conventional budgeting and accounting practices is maintained and at the same time the benefits of a program-oriented system can be realized. This approach is illustrated in Figure 4 which shows a program budget format utilizing a traditional classification for resource category.

c. Budgeting

When the planning and programming processes have been completed, the necessary information is available to develop the actual budget. The conventional form of the budget document is usually required by law, and Novik (1966) predicts it will be unchanged for some time. During the process of preparing the budget is the proper time to review the program, choose between alternatives, and develop operational plans.

The consideration of the resources needed for programs to meet the objectives, and the cost of such resources, will interact in a manner to make planning-programming-budgeting rather complex. As decisions are made, there is considerable movement back and forth between planning, programming, and budgeting since one phase is not completed before the next phase is undertaken. In the early stages of decision making the emphasis is placed on planning, but in the final stages the emphasis is placed on budgeting.

Many strategic choices are made in the planning stage, but the translation of these strategic choices into programs takes place in the program-

Program Budget University Gross Requirements Matrix

Resource Category / Program			College of Arts & Sciences					College of Law					School of Engineering					Total Gross Requirements (end of period)
			'66,	'67,	'68,	'69,	'70	'66,	'67,	'68,	'69,	'70	'66,	'67,	'68,	'69,	'70	
PROFS.		Full																
		Assoc.																
		Asst.																
INSTRUCTORS																		
TEACHING FELLOWS																		
RES. OR LAB. ASSTS.																		
SECRETARIES																		
OFFICE SPACE– No. & Sq. Ft.		Profs.																
		Instrs.																
		Assts.																
		Secs.																
SUPPLIES		Inven.																
		Purch.																
EQUIPMENT		Inven.																
		Purch.																
LIBRARY SUPPORT																		
STUDENT LOADS	Prof.	Day																
		Eve.																
	Instr.	Day																
		Eve.																
	Asst.	Day																
		Eve.																
ROOM LOADS		Day																
		Eve.																
AVERAGE CLASS SIZE		Prof.																
		Other																
AGG. CLASS-ROOM SPACE		Teach.																
		Labs.																

Figure 4

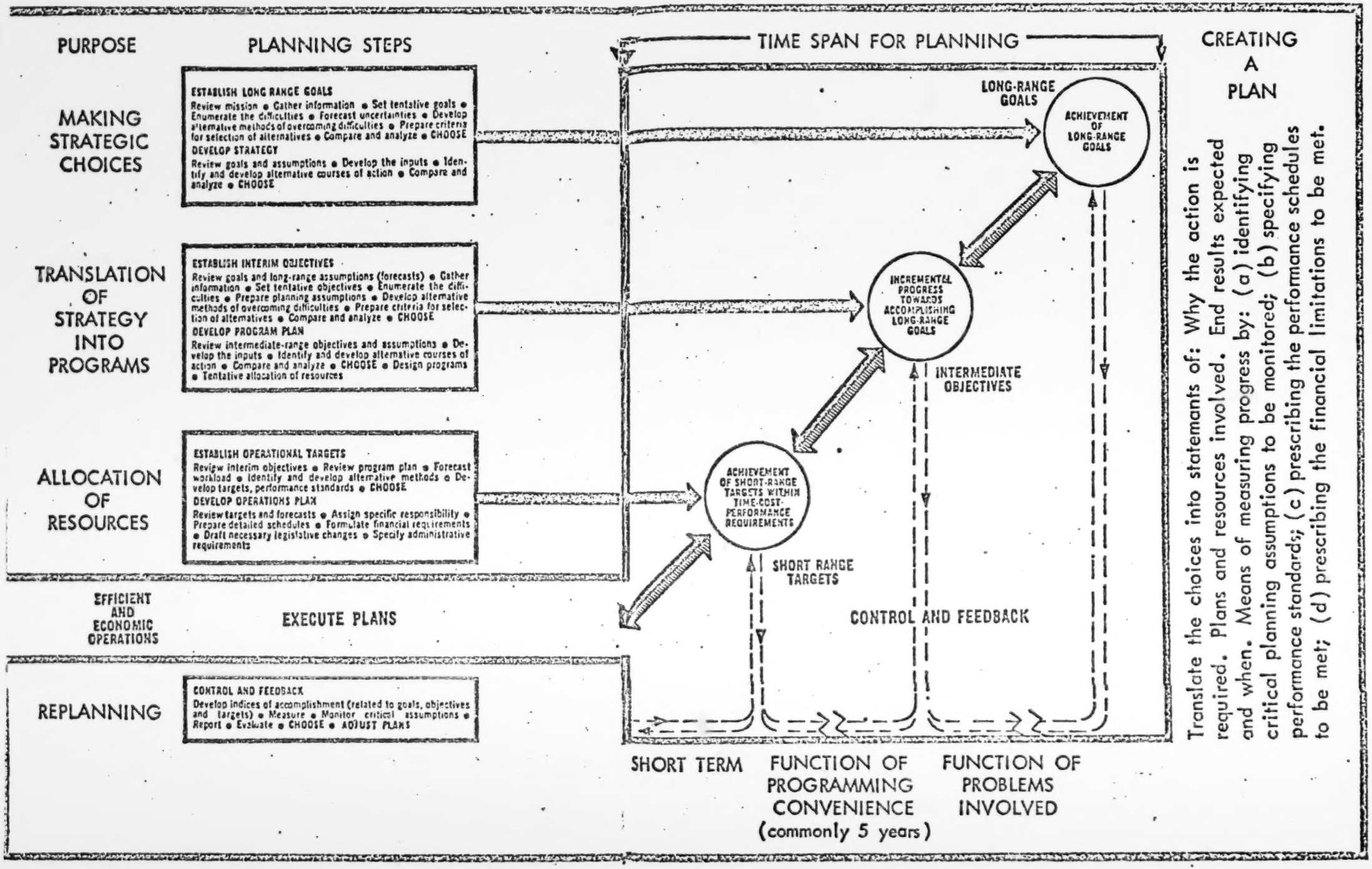
ming stage. The actual allocation of resources occurs during the budgeting stage. The complexity of this process is illustrated in Figure 5.

It is interesting to note that in each of the three steps it is necessary to develop alternative methods and to choose. When departments, schools, colleges, institutes, and libraries do their programming, they almost unavoidably consider the costs of the several alternative means of satisfying their requirements. Nevertheless, as Williams (1966) states, "it must be noted that in a program budgeting system costs are not developed first as the determinant of departmental activity. Alternative departmental activity pursuant to departmental, college, and university objectives should be explored prior to the determination of their costs."

If the basic planning is sound and the programming is intensive and comprehensive, then the resulting budget will reflect the program requirements. Through this process the annual budget will accurately reflect the economic consequences of decisions made at all points in the institution with regard to the use of resources.

Systems Analysis

Systems analysis, cost effectiveness analysis, cost benefit analysis, or operational research as it is variously called, is a management technique. Its basic tenet, according to Hitch (1967) is "to maximize the value of the objectives achieved minus the value of the resources used." Restated this means maximizing objectives for given resources, or minimizing resources


PURPOSE
PLANNING STEPS
TIME SPAN FOR PLANNING
CREATING A PLAN
MAKING STRATEGIC CHOICES
ESTABLISH LONG RANGE GOALS
Review mission • Gather information • Set tentative goals • Enumerate the difficulties • Forecast uncertainties • Develop alternative methods of overcoming difficulties • Prepare criteria for selection of alternatives • Compare and analyze • CHOOSE
DEVELOP STRATEGY
Review goals and assumptions • Develop the inputs • Identify and develop alternative courses of action • Compare and analyze • CHOOSE
LONG-RANGE GOALS
ACHIEVEMENT OF LONG-RANGE GOALS
TRANSLATION OF STRATEGY INTO PROGRAMS
ESTABLISH INTERIM OBJECTIVES
Review goals and long-range assumptions (forecasts) • Gather information • Set tentative objectives • Enumerate the difficulties • Prepare planning assumptions • Develop alternative methods of overcoming difficulties • Prepare criteria for selection of alternatives • Compare and analyze • CHOOSE
DEVELOP PROGRAM PLAN
Review intermediate-range objectives and assumptions • Develop the inputs • Identify and develop alternative courses of action • Compare and analyze • CHOOSE • Design programs • Tentative allocation of resources
INCREMENTAL PROGRESS TOWARDS ACCOMPLISHING LONG-RANGE GOALS
INTERMEDIATE OBJECTIVES
ALLOCATION OF RESOURCES
ESTABLISH OPERATIONAL TARGETS
Review interim objectives • Review program plan • Forecast workload • Identify and develop alternative methods • Develop targets, performance standards • CHOOSE
DEVELOP OPERATIONS PLAN
Review targets and forecasts • Assign specific responsibility • Prepare detailed schedules • Formulate financial requirements • Draft necessary legislative changes • Specify administrative requirements
ACHIEVEMENT OF SHORT-RANGE TARGETS WITHIN TIME-COST-PERFORMANCE REQUIREMENTS
SHORT RANGE TARGETS
EFFICIENT AND ECONOMIC OPERATIONS
EXECUTE PLANS
CONTROL AND FEEDBACK
REPLANNING
CONTROL AND FEEDBACK
Develop indices of accomplishment (related to goals, objectives and targets) • Measure • Monitor critical assumptions • Report • Evaluate • CHOOSE • ADJUST PLANS
Translate the choices into statements of: Why the action is required. Plans and resources involved. End results expected and when. Means of measuring progress by: (a) identifying critical planning assumptions to be monitored; (b) specifying performance standards; (c) prescribing the performance schedules to be met; (d) prescribing the financial limitations to be met.
SHORT TERM
FUNCTION OF PROGRAMMING CONVENIENCE (commonly 5 years)
FUNCTION OF PROBLEMS INVOLVED

A system for comprehensive planning.

Figure 5

for given objectives.

The programming phase of program budgeting is also a management technique. Programming produces programs classified by outputs that are objective-oriented. The resource requirements and the financial or budget implications are linked to these program outputs. The program extends far enough into the future to show to the extent practical and necessary the full resource requirements and financial implications.

A program budgeting system includes a combination of these two management techniques, programming and systems analysis which (Hitch 1967) "are related and mutually supporting, but distinct: in fact, they are so distinct that it is possible to use either without the other."

The function of programming is to cost out the plans to keep them feasible and realistic, to make the planners face up to the hard choices. The function of systems analysis (Hitch 1967) is "to get dollars into the calculations at an earlier stage, into the planning process, into the evaluation of alternative ways of achieving objectives."

Programming provides the link between planning and budgeting, to relate forces and their costs to educational objectives. Systems analysis (Hitch 1967) "provides the quantitative analytical foundation in many areas - but by no means all - for making sound choices among alternative means of achieving the objectives."

To choose the optimal way or even a good way requires knowing about the alternatives, what the alternatives might achieve, and what they would

cost. But as Hitch (1967) points out, quantification of objectives, and therefore full systems analysis, is difficult. He proposes that at least the budget can be organized to be more meaningful for planning purposes. In many areas, a partial cost analysis is possible and useful, although a full systems analysis, including measurement of objectives, is not yet possible.

A Systems Simulation Model

The ultimate desire of the fiscal analyst is to develop a budgetary science so the "best" decisions could be made on the basis of "hard data" and clearly defined goals. To make this concept operational, computers can be utilized to program complete models of an institution. Then the inputs and outputs of the budgetary process can be analyzed with greater precision. Construction of a statistical model of an entire university on a computer is no longer a distant vision (Rourke and Brooks, 1966). Several universities, including the University of Maryland, Purdue University, and the University of California, are already actively engaged in the groundwork for developing such models. These models are simply symbolic representations of the elements of the university as restricted or as complete as the model builder chooses. A model may include data about students, faculties, budgets, library books, buildings, levels and varieties of courses, and almost any other quantifiable data that can be fed into the computer. The analyst can simulate the effects of changing any of the variables upon the total system.

The University of California has acquired a workable backlog of data

on magnetic tape to construct a model of the University which will provide budgetary projections over the next decade (Rourke and Brooks, 1966).

A prototype of a system simulation model was built for the faculty of Arts and Science at the University of Toronto. Judy and Levine (1965) in their report on this project attempted to describe the basic concepts and evaluate the results in non-technical language.

To build a model, each interrelations of the institution's activities must be perceived in a conceptual specification, e.g. total enrollment is transformed into teaching load, into staff requirement, into office, secretarial and administrative requirements. It means describing how demands for lecture halls, laboratories, seminar rooms, and other physical facilities are generated. These abstract descriptions must be expressed in mathematical terms which can take on any assigned values. With the aid of a computer, it is possible to calculate estimates of the quantities of resources required to accomplish the specified program.

The system simulation model does not "automate" any decision. Its role (Judy and Levine, 1965) "is entirely that of a tool that can greatly improve the information with which university planners and decision-makers work."

Conclusions

Conventional budgeting, program budgeting, simulation models, or any other budgeting systems that have been developed are management tools

and not a solution to all budgetary problems. No system can ever substitute for the combined wisdom and experience of educational administrators and faculty. However, an efficient system can focus the energies and talents of all to achieve the vital goals of education.

Better knowledge of the cost consequences of alternatives should improve decisions, reduce the number of unfortunate surprises, and enable institutions to plan rather than respond in the face of unforeseen crises.

A more sophisticated system should make possible more accurate and substantiated statements of financial requirements for legislative bodies and other sources of funds. This should facilitate the flow of finances.

The improved systems and techniques do not guarantee that our choices will always be logical or that decisions will always be made rationally in the light of all the facts. Some decisions may be grossly in error in spite of the most careful studies. Traditional and personal sentiment will continue to be non-economic. But the improved methods of allocating financial resources will mean that fewer allocation decisions will be made in the dark.

BIBLIOGRAPHY

Anshen, M. The Federal Budget As An Instrument for Analysis, Planning, and Management. Santa Monica, California: The Rand Corp., 1965.

Corbally, John E. Jr. School Finance. Boston: Allyn and Bacon, Inc., 1962.

Hirsch, Werner Z. "Education in the Program Budget," Program Budgeting, edited by David Novick (1965), pp. 178-207.

Hitch, Charles J. "Program Budgeting," Datamation, (September, 1967), pp. 37-40.

Hungate, Thad L. Finance in Educational Management of Colleges and Universities. New York: Columbia University, Teachers College, 1954.

----- Management in Higher Education. New York: Columbia University, Teachers College, 1964.

Judy, Richard W. and Levine, Jack B. A New Tool for Educational Administrators. Toronto: University of Toronto Press, 1965

Keezer, Dexter M. (editor). Financing Higher Education 1960-1970. New York: McGraw-Hill Book Co., 1959.

Likert, Rensis. New Patterns of Management. N.Y.: McGraw-Hill Book Company, Inc., 1961.

Millett, John D. Financing Higher Education in the United States. N.U.: Columbia University Press, 1952.

Morey, Lloyd. University and College Accounting. New York: John Wiley and Sons, Inc., 1930.

National Committee on the Preparation of a Manual on College and University Business Administration. College and University Business Administration. Washington, D.C.: American Council on Education, 1952.

National Committee on Standard Reports for Institutions of Higher Education. Financial Reports for Colleges and Universities. Chicago: The University of Chicago Press, 1935.

Novik, David. Program Budgeting: Program Analysis and the Federal Budget. Cambridge: Howard University Press, 1965.

Rourke, Francis E. and Brooks, Glenn C. The Managerial Revolution in Higher Education. Baltimore: John Hopkins University Press, (1966).

Russell, John Dale. The Financing of Higher Education. Chicago: The University of Chicago Press, 1954.

Smithies, Arthur. "Conceptual Framework for the Program Budget," Program Budgeting, edited by David Novick (1965), pp. 24-60.

Steiner, George A. "Problems in Implementing Program Budgeting," Program Budgeting, edited by David Novick (1965), pp. 308-352.

Williams, Harry. Planning for Effective Resource Allocation in Universities. Washington: American Council on Education, 1966.